2009

Seattle Fire Department
Emergency Response Report

Message from the Fire Chief

At the Seattle Fire Department, we strongly believe in community involvement. With 33 fire stations located throughout the city, we have a presence in every neighborhood.

Our value to the community is measured by the service we can provide. Every day our firefighters and paramedics strive to provide the best emergency and medical services possible to the citizens of Seattle.

Gregory M. Dean, Fire Chief

Department Mission

Our mission is to prevent the loss of life and property resulting from fires, medical emergencies and other disasters. We accomplish our mission through highly trained firefighters, a focus on fire prevention and education and nationally recognized emergency medical skills.

In addition to our daily protection of life and property, the Seattle Fire Department is committed to making Seattle the most prepared city in America. We're accomplishing this through additional training for our firefighters, Hazardous Materials, Marine and Technical Rescue teams. We have also formed regional partnerships with other fire departments to strengthen resources during an emergency.

Department Overview

The Seattle Fire Department has existed as a fire department within the State of Washington since October 17, 1889, when the Seattle City Council passed Ordinance No. 1212.

The services provided by the Seattle Fire Department include:

- Fire and emergency medical response
- Special Operations (technical and heavy rescue, marine fire response and rescue, dive rescue, wildland firefighting, chemical, biological, radiological, nuclear and explosive (CBRNE) response and emergency preparedness)
- Hazardous Materials response
- Mutual aid response to neighboring jurisdictions
- Fire prevention and public education
- Fire investigation

City of Seattle Profile

- Population - 563,400 (1.5 million during the day)
- Population Density - 6,039 per square mile
- Land Area - 83.9 square miles
- Waterfront - 193 miles (53 miles of tidal waters)

SFD Personnel Profile (2009)

- Uniformed Personnel - 1,020
- On-Duty Strength - 208
- Department Chiefs - 35
- Firefighter/Emergency Medical Technicians (EMT) - 1,020
- Paramedics - 74
- Non-Uniformed (Civilian) Personnel - 87

Department Apparatus Profile

33 Fire Engines

11 Ladder Trucks

7 Medic Units

4 Aid Units

4 Fireboats

2 Mobile Air Compressors

1 Hazardous Materials Response Unit

1 Technical Rescue Unit

1 Marine Response Unit

1 Mobile Ventilation Unit

1 Decontamination Unit

Not Pictured:

2 Hose Wagons

1 Mobile Command Unit

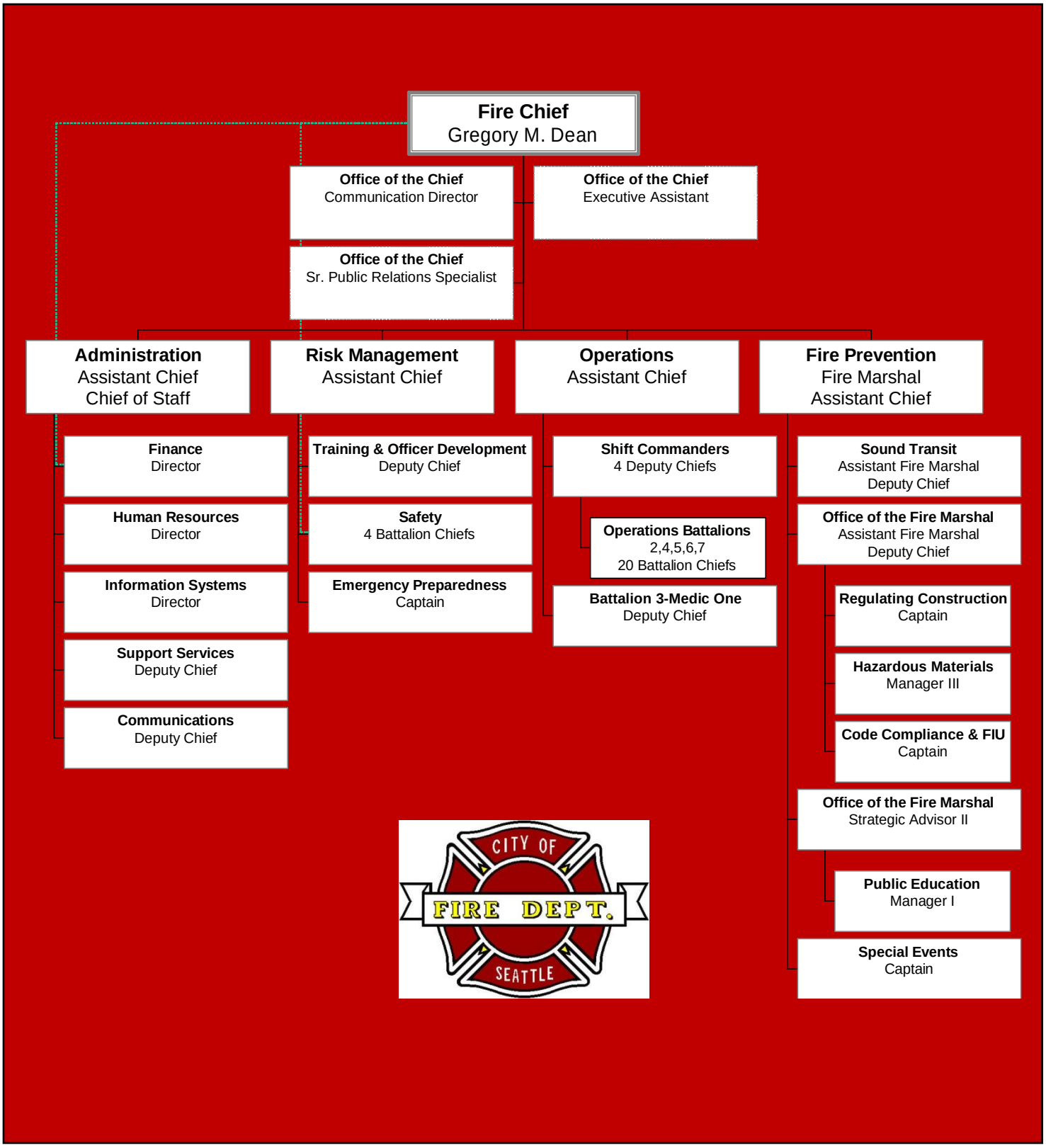
1 Mass Casualty Incident Response Unit

1 Mobile Generator

1 Air Truck

Department Organization Chart

The Seattle Fire Department is organized into four major divisions: Administration, Risk Management, Operations and Fire Prevention.



Seattle Fire Emergency Response Totals

	2005	2006	2007	2008	2009
Basic Life Support (BLS)	**4,1848**	**43,476**	**43,488**	**44,598**	**44,373**
% increase/decrease	3.81%	3.89%	0%	2.65%	-0.5%
Advanced Life Support (ALS)	**20,010**	**20,330**	**20,330**	**19,829**	**18,866**
% increase/decrease	2.7%	1.6%	0%	-2.5%	-4.6%
Total EMS (Emergency Medical Services)	**61,858**	**63,806**	**63,778**	**64,427**	**63,239**
% increase/decrease	3.45%	3.15%	0%	1%	-1.8%
Fire	**15,260**	**16,717**	**15,292**	**14,840**	**14,551**
%increase/decrease	-4.4%	7.19%	-8.82%	-2.96%	-1.9%
Total Responses	**77,118**	**80,523**	**79,070**	**79,267**	**77,790**
% increase/decrease	1.8%	4.4%	-1.8%	0%	1.9%

***Annual number of emergency responses by company listed in Annex B on page 14.**

House Bill 1756

Substitute House Bill 1756 (SHB 1756) was passed into law during the 2005 legislative session. This law mandates certain response criteria be established and measured by certain fire departments across the State of Washington, beginning in 2007 with an analysis of responses in 2006. The requirement was passed and now is the law for all substantially career fire departments.

The purpose of this law is to report to the Governing Body of each fire jurisdiction, as well as to the citizens of any given area how the fire department is doing in meeting its established emergency response standards. These standards take into consideration a number of response types:

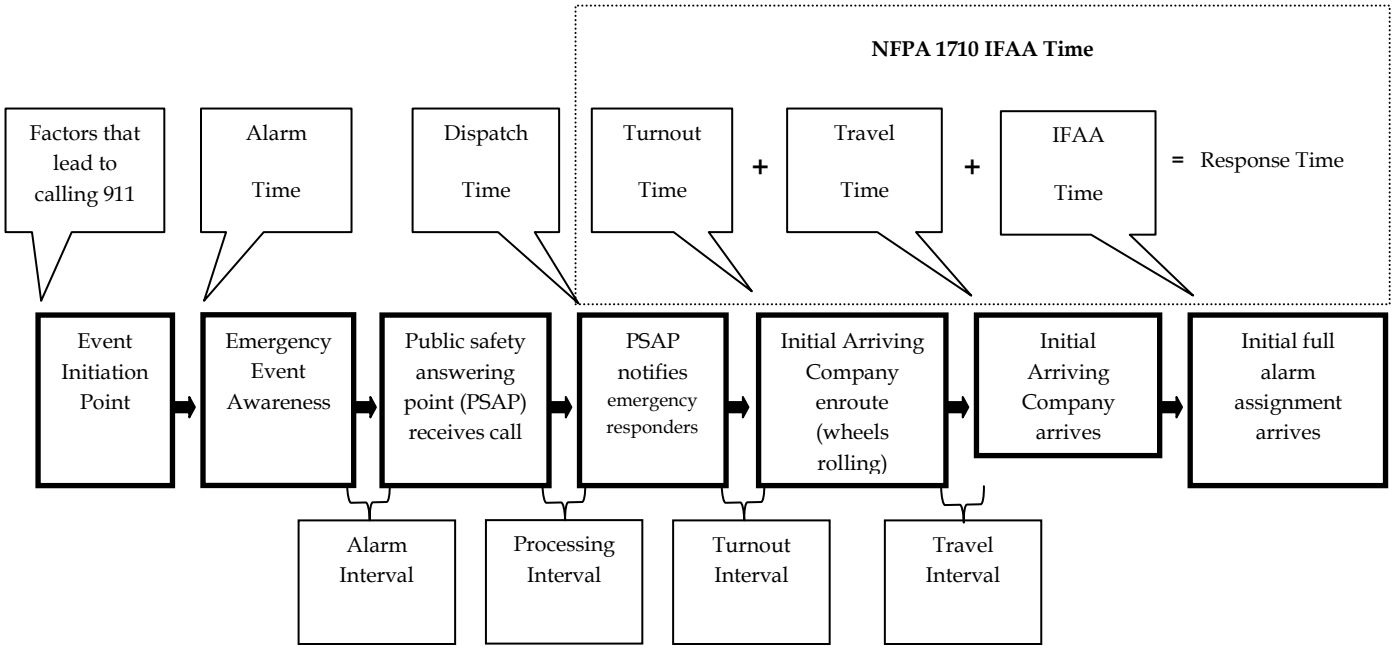
a) Fire Suppression
b) Emergency Medical Services-Basic Life Support (BLS)
c) Emergency Medical Services-Advanced Life Support (ALS)
d) Special Operations (i.e. Hazardous Materials response and Technical Rescue response)
e) Aircraft rescue and firefighting
f) Marine rescue and firefighting
g) Wildland firefighting

***Definitions of terminology used to describe response standards available in Annex C on pages 15-16.**

CASCADE OF EVENTS

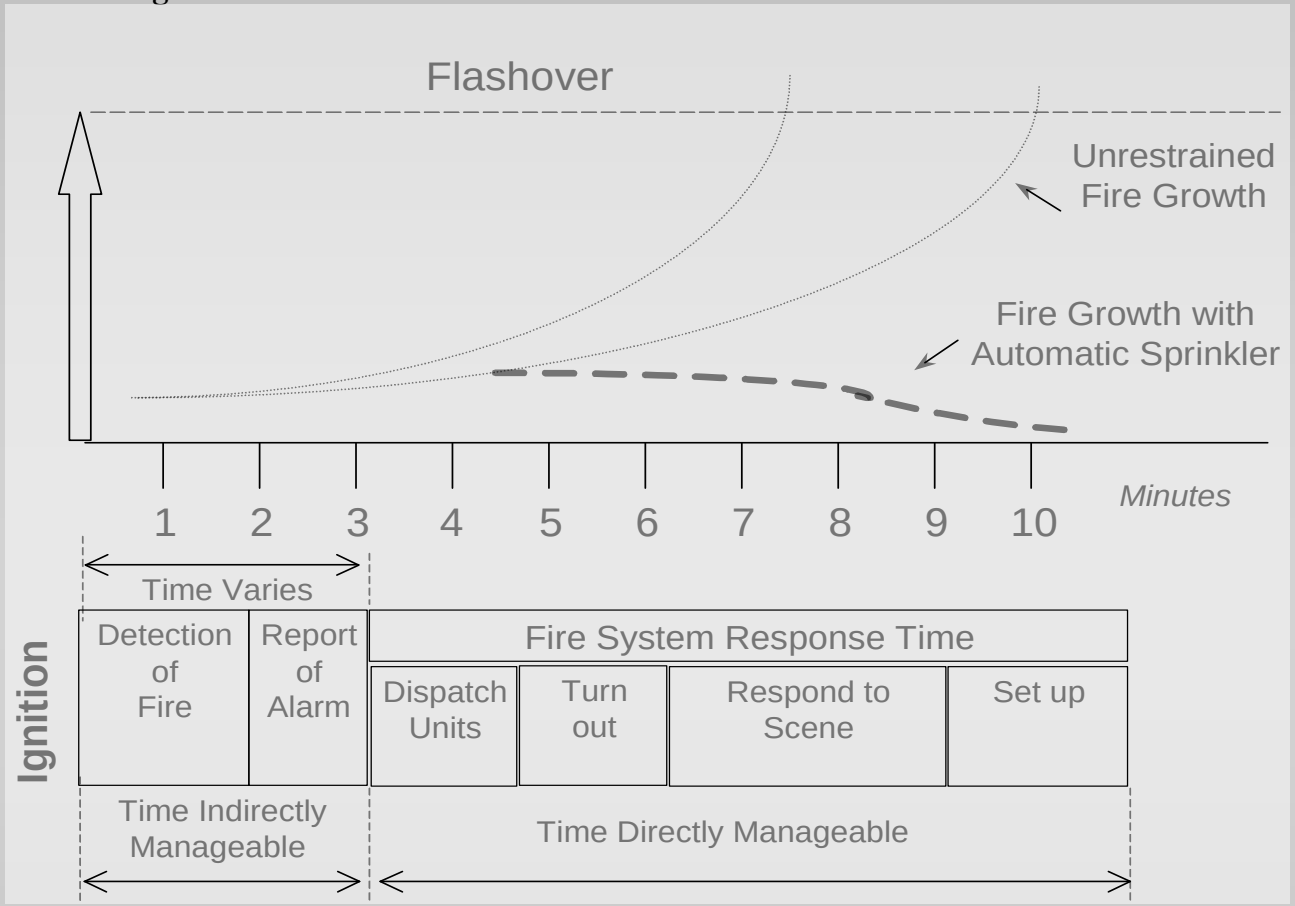
The Commission on Fire Accreditation International (CFAI) has defined response time elements as a cascade of events. This cascade is similar to that used by the medical community to describe the events leading up to the initiation, mitigation, and ultimate outcome of a cardiac arrest. It is imperative to keep in mind that certain intervals described, such as turnout and travel time, can be directly influenced by the fire service via station locations and design, staffing levels, as well as local rules and procedures for response. Others factors, such as the alarm interval, can be influenced indirectly through public education and engineering initiatives. The fire service can also influence the call-processing interval through its ability to define standards and compel performance by its dispatch centers.

Cascade of Events – General Overview



TIME TEMPERATURE STANDARD

The "time-temperature curve" standard in the figure below is based on data from the National Fire Protection Association (NFPA) and the Insurance Services Organization (ISO), which have established that a typical point source of ignition in a residential house will "flash over" at some time between 5 and 10 minutes after ignition, turning a typical "room and contents" fire in to a structural fire of some magnitude.



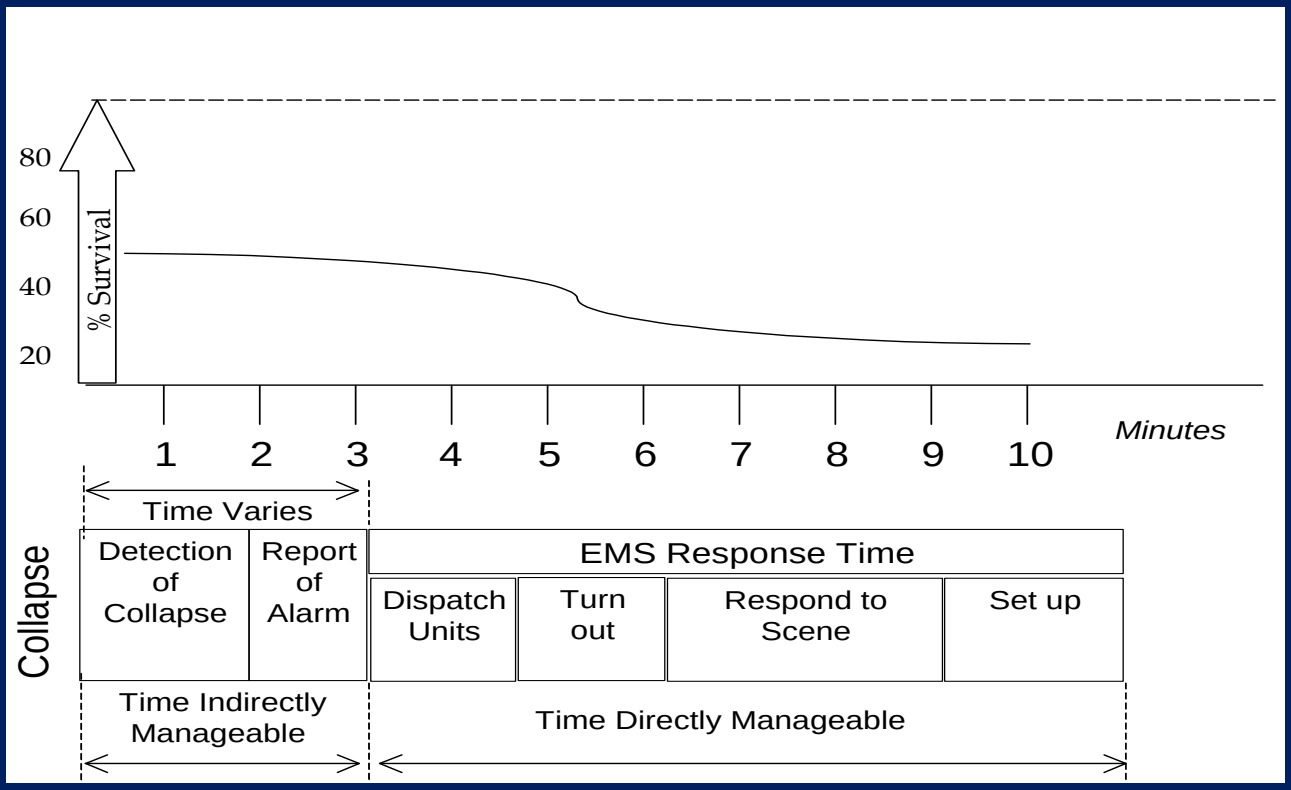
Time Temperature Curve

The utility of the time-temperature curve for fire station placement is limited to a number of factors, including but not limited to the following:

- It does not account for the time required for the existence of a fire to be "discovered" and reported to the fire department via the 911 system.
- The time from ignition to flashover varies widely (5-30 minutes depending on building characteristics); thus it cannot provide a valid basis for the allocation of resources.
- The curve is constantly shifting, given the numerous changes in building construction, built in suppression systems, the increased use of fire resistive materials for furniture, and other items typically found in the interior of occupied buildings.

Cardiac Arrest Survival Standard

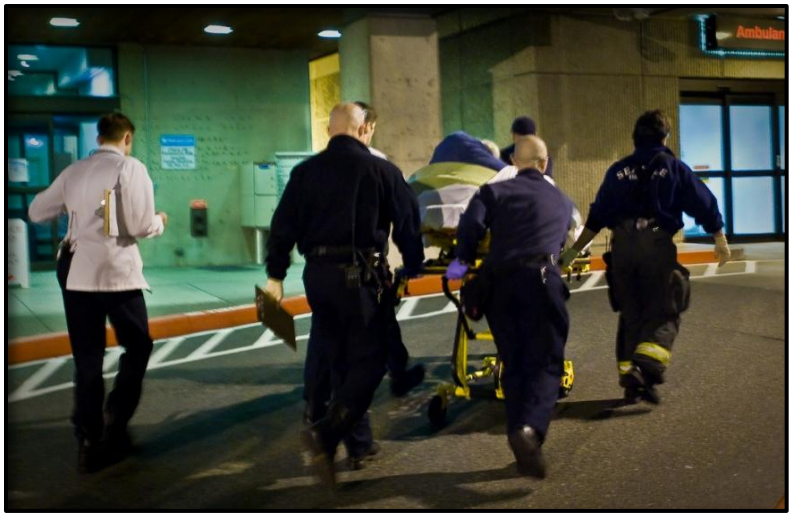
In communities where the fire service is the principal provider of Emergency Medical Services (EMS) first response, the "chain of survival" standard shown in the figure below was developed by the American Heart Association and is often used to provide guidance for distribution of resources. The chain of survival suggests that basic life support (CPR and defibrillation) should be available to the victim of a cardiac arrest within 4 minutes of the event, and that advanced life support (paramedic service) should be available within 8 minutes or less of the event. Early notification, distribution and concentration of emergency response services are thus paramount to successful resuscitation efforts.



Cardiac Arrest Survival

The Golden Hour Standard

In trauma events, the golden hour is the historic benchmark applied to victims with significant critical traumatic injuries. The golden hour reflects the concept that survivability decreases significantly if the patient isn't in the operating room within one hour of receiving a critical traumatic injury.



SEATTLE FIRE DEPARTMENT RESPONSE STANDARDS

The Seattle Fire Department Response Standards specify the minimum criteria needed to effectively and efficiently deliver fire suppression, special operations response, and emergency medical services. These Response Standards protect the citizens of Seattle and the occupational safety and health of Seattle Fire Department employees. National Fire Protection Association Standard 1710 - *Standard for the Organization and Deployment of Fire Suppression Operations, Emergency Medical Operations, and Special Operations to the Public by Career Fire Departments*, was used as a guideline in the development of the Seattle Fire Department Response Standards.

***Monthly response data is listed in Annex A, pages 12-13.**

Call Processing Time

(Phone pickup to first unit assigned)

Seattle Fire Department call processing time standard is 60 seconds, 90% of the time.

Year	Percentage of time call processing time standard met
2009	39%
2008	39%
2007	34%
2006	30%

Turnout Time

(Time unit assigned to enroute)

Seattle Fire Department turnout time standard is 60 seconds, 90% of the time.

Year	Percentage of time turnout time standard met
2009	31%
2008	31%
2007	31%
2006	31%

First Arriving Engine at Fire

(Enroute to on scene)

Seattle Fire Department response time standard for the first arriving engine at a fire response is 4 minutes, 90% of the time.

Year	Percentage of time response time objective met
2009	84%
2008	84%
2007	86%
2006	83%

SEATTLE FIRE DEPARTMENT RESPONSE STANDARDS

Full First Alarm Assign. at Fire
(Enroute to on scene)

Seattle Fire Department response time standard for full first alarm assignment (15 firefighters) when responding to a fire is 8 minutes, 90% of the time.

Year	Percentage of time response time objective met
2009	85%
2008	88%
2007	87%
2006	80%

Basic Life Support Unit
(Enroute to on scene)

Seattle Fire Department response time standard for the arrival of the first emergency medical unit with 2 EMT's is 4 minutes, 90% of the time.

Year	Percentage of time response time objective met
2009	85%
2008	86%
2007	87%
2006	87%

Advanced Life Support Unit
(Enroute to on scene)

Seattle Fire Department response time standard for the arrival of an advanced life support unit with 2 Paramedics is 8 minutes, 90% of the time.

Year	Percentage of time response time objective met
2009	85%
2008	84%
2007	84%
2006	86%

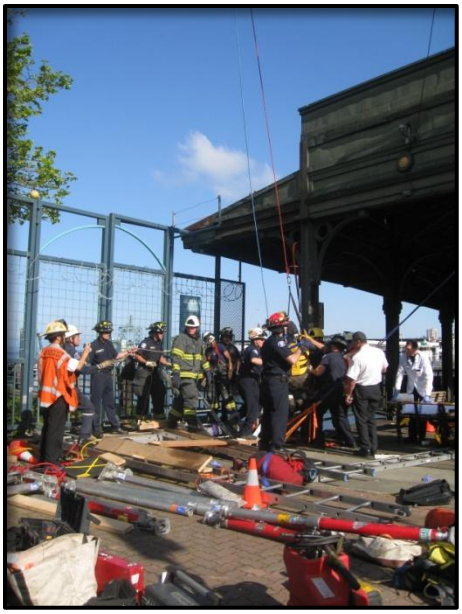
Special Operations Responses

The Seattle Fire Department has developed special operations response Policies and Operating Guidelines (POG) that specify the roles and responsibilities of the fire department and the authorized functions of members responding to incidents that meet the definition of "special operations" in accordance with NFPA 1710, which reads as follows:

> *Those emergency incidents to which the fire department responds that require specific and advanced training and specialized tools and equipment.*

These types of incidents include but are not limited to hazardous materials, technical and heavy rescue, marine fire response and rescue, dive rescue, wildland firefighting, and CBRNE response however in all cases the fire department is limited to performing only those specific special operations functions for which responding personnel have been trained and are correctly equipped.

The Seattle Fire Department Firefighters are trained to Operations Level for response to special operations incidents within the Seattle Fire Department. The Seattle Fire Department's response time standard for operational level firefighters is the same as a fire suppression call. Arrival of "technician" or special operations level trained response teams has not historically been tracked.



Special Operations 2009 Response Totals

Unit	Response Type	Count	Avg Travel Time
Ladder 7	Technical Rescue	196	8.45 minutes
HazMat 1	Hazardous Materials	37	9.37 minutes
Engine 36	Marine Emergency	4	5.98 minutes

Fire Boats 2009 Response Totals

Unit	Count	Avg Travel Time
Engine 4 (Salt Water)	185	11.20 minutes
Engine 3 (Fresh Water)	22	20.36 minutes
Engine 1 (Fast Attack)	55	18.67 minutes

ANNEX A:

2009 RESPONSE STATISTICS/PERFORMANCE MEASURES

Percentage of the time that the first engine company arrives within 4 minutes for any incident. NFPA 1710 is 90%.

	Jan.	Feb.	Mar.	Apr.	May	Jun.	Jul.	Aug.	Sep.	Oct.	Nov.	Dec.	YTD
Incidents	**3,664**	**3,208**	**3,711**	**3,626**	**3,893**	**3,949**	**4,531**	**4,044**	**3,825**	**4,009**	**3,671**	**3,956**	**46,087**
2009	84%	85%	86%	85%	83%	83%	83%	83%	84%	84%	83%	84%	84%
2008 baseline	86%	86%	86%	86%	87%	85%	85%	86%	83%	83%	84%	76%	84%
2007 baseline	83%	86%	85%	87%	86%	86%	84%	86%	86%	86%	86%	87%	86%
2006 baseline	85%	83%	84%	84%	83%	82%	81%	82%	83%	85%	83%	82%	83%

Percentage of the time that a full-alarm assignment of firefighters (minimum 15) is on scene within 8 minutes for a fire emergency. NFPA 1710 is 90%.

	Jan.	Feb.	Mar.	Apr.	May	Jun.	Jul.	Aug.	Sep.	Oct.	Nov.	Dec.	YTD
2009 Incidents	18	19	15	26	18	25	26	17	30	20	19	12	214
2009 Results	93%	73%	80%	85%	94%	88%	64%	95%	100%	74%	75%	88%	84%
2008 Baseline	94%	85%	87%	85%	89%	84%	77%	94%	93%	95%	84%	91%	88%
2007 Baseline	80%	92%	100%	91%	91%	88%	90%	89%	79%	75%	80%	91%	87%
2007 Heavy Days	22	10	6	7	11	7	2	4	3	8	13	8	101
2006 Baseline	85%	83%	82%	86%	83%	85%	84%	78%	82%	67%	68%	79%	80%

ANNEX A:

2009 RESPONSE STATISTICS/PERFORMANCE MEASURES

Percentage of the time that any first unit arrives within 4 minutes for an EMS incident (BLS or ALS). NFPA 1710 is 90%.

	Jan.	Feb.	Mar.	Apr.	May	Jun.	Jul.	Aug.	Sep.	Oct.	Nov.	Dec.	YTD
2009 Incidents	4,607	4,344	4,497	4,473	4,820	4,517	4,704	4,896	4,514	4,582	4,416	4,731	45,954
2009 Results	86%	86%	86%	86%	85%	85%	85%	85%	85%	84%	85%	85%	85%
2008 Baseline	87%	86%	88%	87%	87%	86%	86%	88%	84%	85%	86%	79%	
2007 Baseline	85%	87%	86%	87%	86%	87%	87%	87%	87%	86%	87%	89%	87%
2006 Baseline	89%	87%	89%	88%	88%	87%	87%	88%	88%	86%	84%	85%	87%
2006 Baseline	85%	83%	82%	86%	83%	85%	84%	78%	82%	67%	68%	79%	80%

Percentage of the time that a first Advanced Life Support (ALS – paramedic) unit arrives within 8 minutes for an ALS incident. NFPA 1710 is 90%.

	Jan.	Feb.	Mar.	Apr.	May	Jun.	Jul.	Aug.	Sep.	Oct.	Nov.	Dec.	YTD
Incidents	1,474	1,444	1,437	1,396	1,482	1,372	1,377	1,432	1,356	1,331	1,416	1,322	14,101
2009 Results	85%	85%	86%	83%	85%	87%	84%	84%	86%	85%	83%	84%	85%
2008 Baseline	86%	84%	83%	83%	87%	85%	86%	83%	86%	85%	85%	81%	85%
2007 Baseline	86%	84%	83%	85%	84%	84%	84%	85%	86%	83%	82%	83%	84%
2006 Baseline	87%	86%	87%	86%	86%	87%	86%	87%	86%	85%	85%	82%	86%
2006 Baseline	85%	83%	82%	86%	83%	85%	84%	78%	82%	67%	68%	79%	80%

ANNEX B:

EMERGENCY RESPONSE TOTALS BY COMPANY

Company	2005	2006	2007	2008	2009
Aid 2	5,863	5,268	6,287	6,305	5496
Aid 5	4,865	6,164	4,937	5,126	5,717
Aid 14	1,514	1,540	1,449	1,498	1,506
Aid 17	31	28	7	0	0
Aid 25	5,516	5,508	5,420	5,411	5,018
Air 9	594	644	561	484	459
Battalion 2	1,176	1,188	1,031	984	861
Battalion 4	533	538	461	438	439
Battalion 5	834	939	844	859	739
Battalion 6	819	765	691	639	616
Battalion 7	305	365	300	292	289
Com Van	13	6	10	8	7
Decon 1	-	2	3	1	2
Deputy 1	661	800	682	638	584
Engine 1	0	0	0	22	55
Engine 2	3,410	3,528	3,501	3,592	2,775
Engine 3	39	42	90	87	22
Engine 4	151	136	154	190	185
Engine 5	2,349	2,440	2,541	2,456	3,007
Engine 6	2,685	2,808	2,772	2,656	2,534
Engine 8	1,566	1,601	1,569	1,830	1,488
Engine 9	1,846	1,898	1,860	1,765	1,830
Engine 10	2,300	2,608	2,386	2,524	2,624
Engine 11	2,102	2,160	2,006	2,013	1,839
Engine 13	1,867	2,104	1,992	1,835	1,967
Engine 16	1,822	1,970	1,745	1,688	1,858
Engine 17	3,225	3,186	2,789	2,863	2,848
Engine 18	2,331	2,328	2,354	2,368	2,301
Engine 20	1,307	1,272	1,195	1,239	1,230
Engine 21	1,744	1,751	1,681	1,684	1,872
Engine 22	1,410	1,382	1,206	1,186	1,226
Engine 24	2,313	2,268	2,282	2,455	2,457
Engine 25	3,160	3,115	2,925	2,959	2,620
Engine 26	945	953	844	754	821
Engine 27	1,235	1,202	1,154	1,130	1,123
Engine 28	3,482	3,475	3,273	3,250	3,488

Company	2005	2006	2007	2008	2009
Engine 29	1,384	1,338	1,332	1,347	1,391
Engine 30	1,822	2,020	2,020	1,915	2,010
Engine 31	3,178	3,230	3,174	3,152	3,141
Engine 32	1,835	1,882	1,710	1,766	1,804
Engine 33	2,390	2,573	2,483	2,376	2,390
Engine 34	1,108	1,175	1,035	1,057	990
Engine 35	1,676	1,713	1,580	1,641	1,635
Engine 36	859	963	914	872	898
Engine 37	2,020	2,187	2,163	2,251	2,164
Engine 38	1,813	1,989	1,905	1,781	1,844
Engine 39	2,443	2,469	2,502	2,383	2,471
Engine 40	1,591	1,590	1,628	1,554	1,615
Engine 41	966	891	909	878	959
Ladder 1	1,525	1,725	1,583	1,598	1,726
Ladder 3	1,116	1,141	1,098	1,098	1,129
Ladder 4	2,096	2,054	2,133	2,105	1,696
Ladder 5	1,659	1,621	1,661	1,555	1,561
Ladder 6	689	713	701	811	690
Ladder 7	1,064	1,147	1,050	1,134	950
Ladder 8	1,058	1,020	968	974	1,005
Ladder 9	1,759	1,807	1,557	1,556	1,556
Ladder 10	1,811	1,753	1,693	1,741	1,490
Ladder 11	933	1,046	922	917	863
Ladder 12	1,361	1,358	1,227	1,269	1,284
Medic 1	4,367	4,530	4,465	4,461	4,157
Medic 10	4,320	4,518	4,511	4,543	4,131
Medic 16	3,106	3,088	3,004	2,921	2,856
Medic 18	2,512	2,403	2,388	2,251	2,269
Medic 28	3,109	3,039	2,878	2,762	2,712
Medic 31	2,844	2,894	2,932	2,784	2,707
Medic 32	2,887	2,778	2,545	2,482	2,315
Medic 44	731	756	614	598	503
Medic 80	79	64	144	152	19
Rescue 14	116	251	61	-	5
Safety 2	856	988	826	754	686
Staff 10	673	809	700	645	591

ANNEX C:

DEFINITIONS OF TERMINOLOGY

Careful definition of terminology is essential to any conversation about response performance standards. It becomes even more critical when an organization attempts to benchmark its performance against other providers. The following definitions are standardized for discussion of response performance parameters within the Fire Service:

Event Initiation Point: The point at which factors occur that may ultimately result in an activation of the emergency response system. Precipitating factors can occur seconds, minutes, hours, or even days before emergency event awareness is reached. An example is the patient who ignores chest discomfort for days until it reaches a critical point at which he/she makes the decision to seek assistance (emergency event awareness). It is rarely possible to quantify the point at which event initiation occurs.

Emergency Event Awareness: The point at which a human being or technologic "sentinel" (i.e., smoke detector, infrared heat detector, etc.) becomes aware that conditions exist requiring an activation of the emergency response system. This is considered the emergency event awareness.

Alarm Interval: Measured time between emergency event awareness and the alarm time.

Alarm Time: The point of receipt of the emergency event at the Public Safety Answering Point (PSAP); the point where sufficient information is made known to the dispatcher so that applicable units can be deployed to the emergency.

Call Processing Interval: The first ring of the 911 telephones at the dispatch center and the time the Computer Aided Dispatch (CAD) operator activates station and/or company alerters, pagers, bells, etc. This can, if necessary, be broken down into two additional parameters: "*call taker interval*" (the interval from the first ring of the 9-1-1 telephone until the call taker transfers the call to the dispatcher), and "*dispatcher interval*" (the interval from the time when the call taker transfers the call to the dispatcher until the dispatcher (CAD operator) activates station and/or company alerting devices. The "call taker interval" also includes the time taken to transfer the call from the primary PSAP (Police) call taker to the secondary PSAP (Fire) call taker. Sixty (60) seconds is an industry standard.

- ❖ Measured time between alarm time and dispatch time.

Dispatch Time: Is the time when the dispatcher, having selected appropriate units for response with assistance from the CAD system, initiates the notification of response units.

Turnout Interval: Measured time between dispatch time and turnout time.

Turnout Time: When units acknowledge notification of the event to the beginning point of response time (wheels rolling).

- ❖ Measured component known as "Turnout Time" required by HB1756*

ANNEX C:

DEFINITIONS OF TERMINOLOGY

Travel Interval: Measured time between turnout time and on scene time of initial company.

- ❖ Measured component known as "Response Time" required by HB1756*

Initial Company Time: The point at which the initial company arrives on scene.

Initiation of Action: The point at which operations to mitigate the event begin.

Initial Full Alarm Assignment Interval: Measured time between initial company on scene time and arrival of the balance of the Initial Full Alarm Assignment.

Initial Full Alarm Assignment: Time when all of the personnel, equipment, and resources ordinarily dispatched upon alarm arrives on the scene.

- ❖ Measured component required by HB1756 for fire suppression responses*

Response Time: The combined measured time from dispatch time, and includes turnout and travel intervals, to initial company arrival time.

Controlled Time: The point at which fire growth has been stopped and/or when initial basic life support concerns have been addressed.

Termination of Event: The point at which units have completed the assignment and are available to respond to another request for service.

ANNEX D:

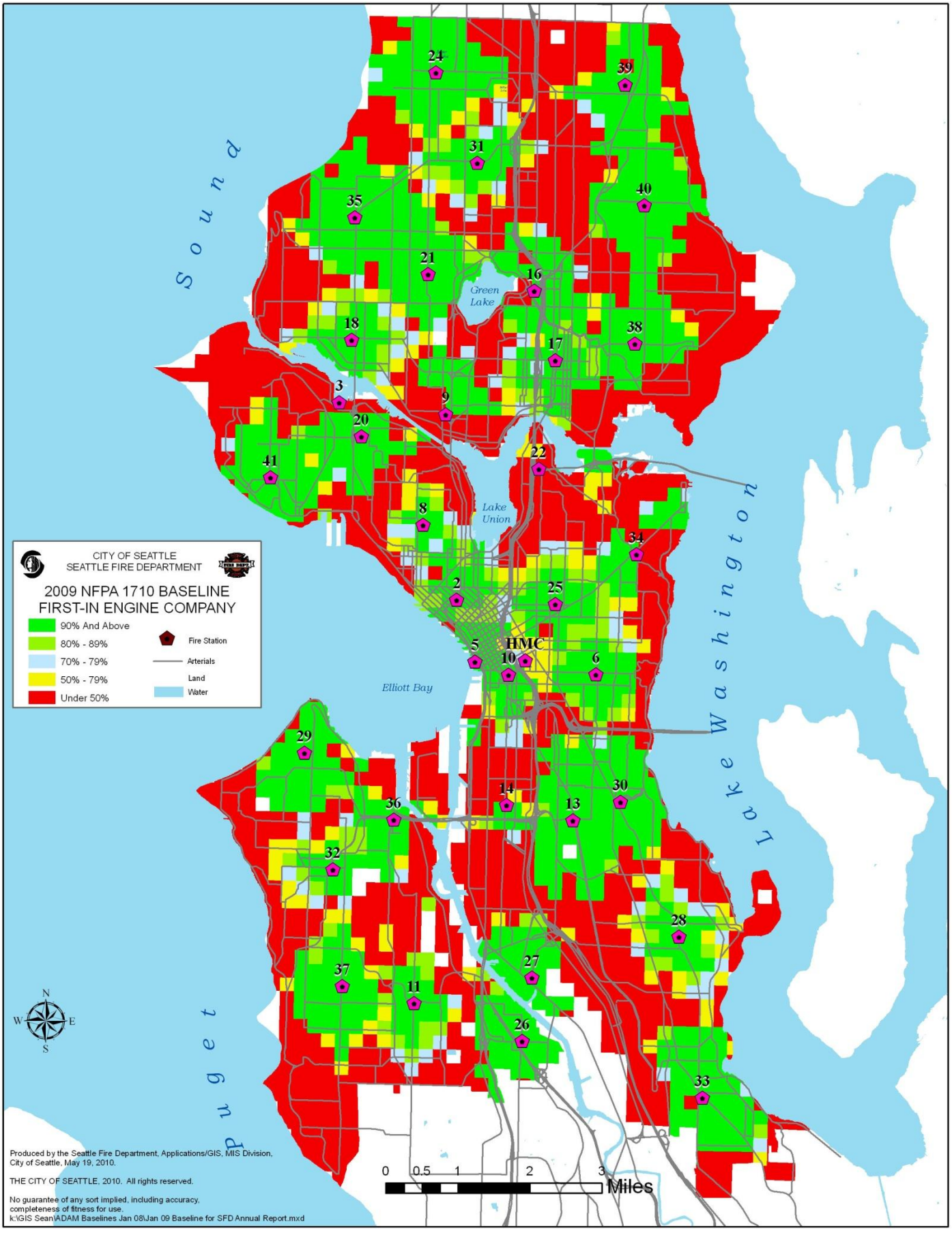
EMERGENCY RESPONSE COVERAGE AREA MAPS

A number one consideration in emergency response is how long it will take the firefighters and/or paramedics to arrive at an incident. In fires and medical emergencies minutes can, and often do, make the difference between life and death. This is why fire stations are located central to their response areas and in consideration of traffic flow patterns.
The following four color coded maps in the show emergency response coverage for four different types of responses:

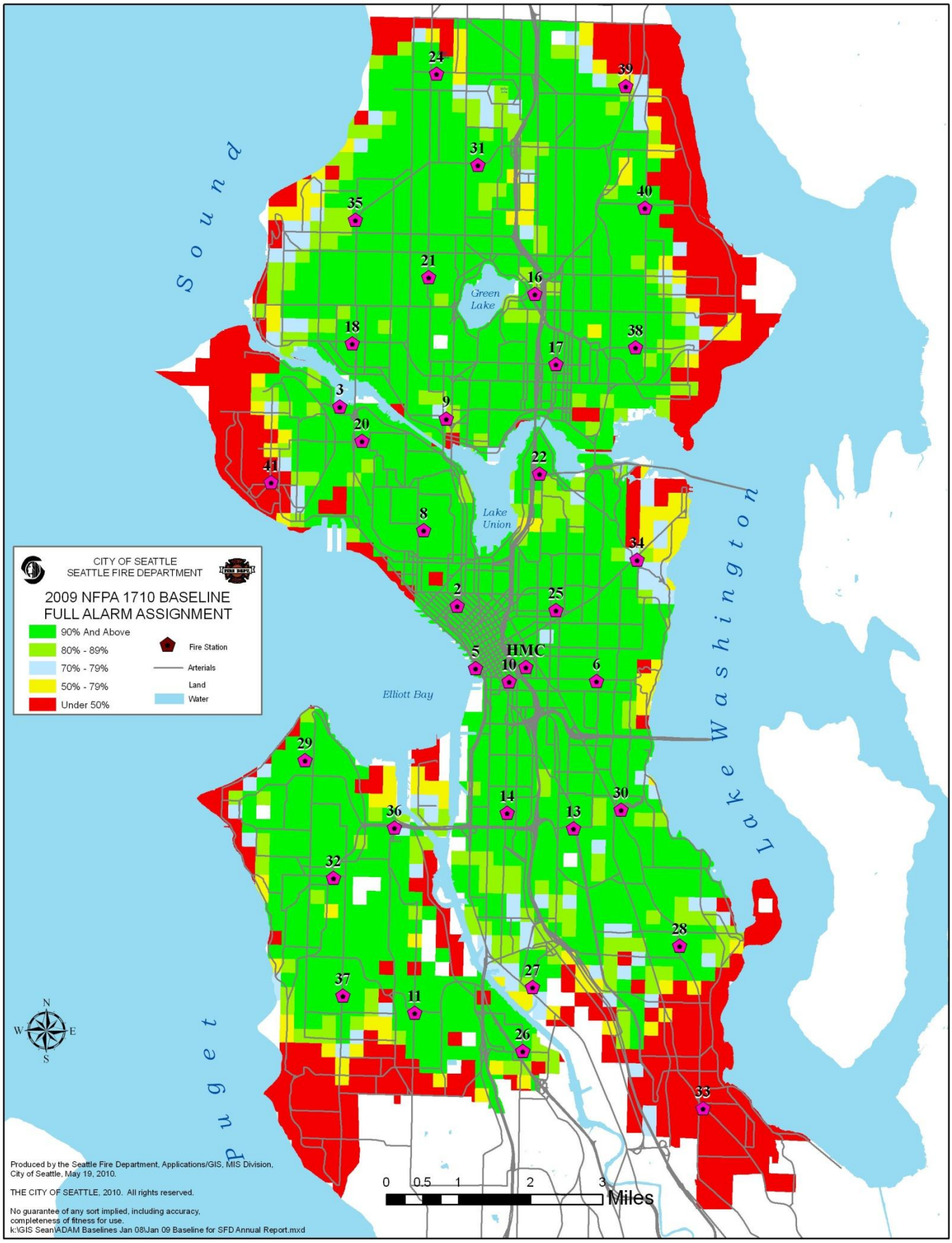
Annex D-I: First Arriving Engine Company
Annex D-II: Full Alarm Assignment Coverage
Annex D-III: Basic Life Support Coverage
Annex D-IV: Advanced Life Support Coverage

In general, the further away from a fire station the incident occurs, the longer it takes for firefighters and/or paramedics to get to the emergency. The green shaded areas on the map indicate response times to incidents that meet the NFPA standard 80% of the time or more. The yellow shaded areas on the map indicate response times that meet the NFPA standard 50 to 79% of the time. The red areas on the map indicate response times to incidents that meet the NFPA standard less than 50% of the time.

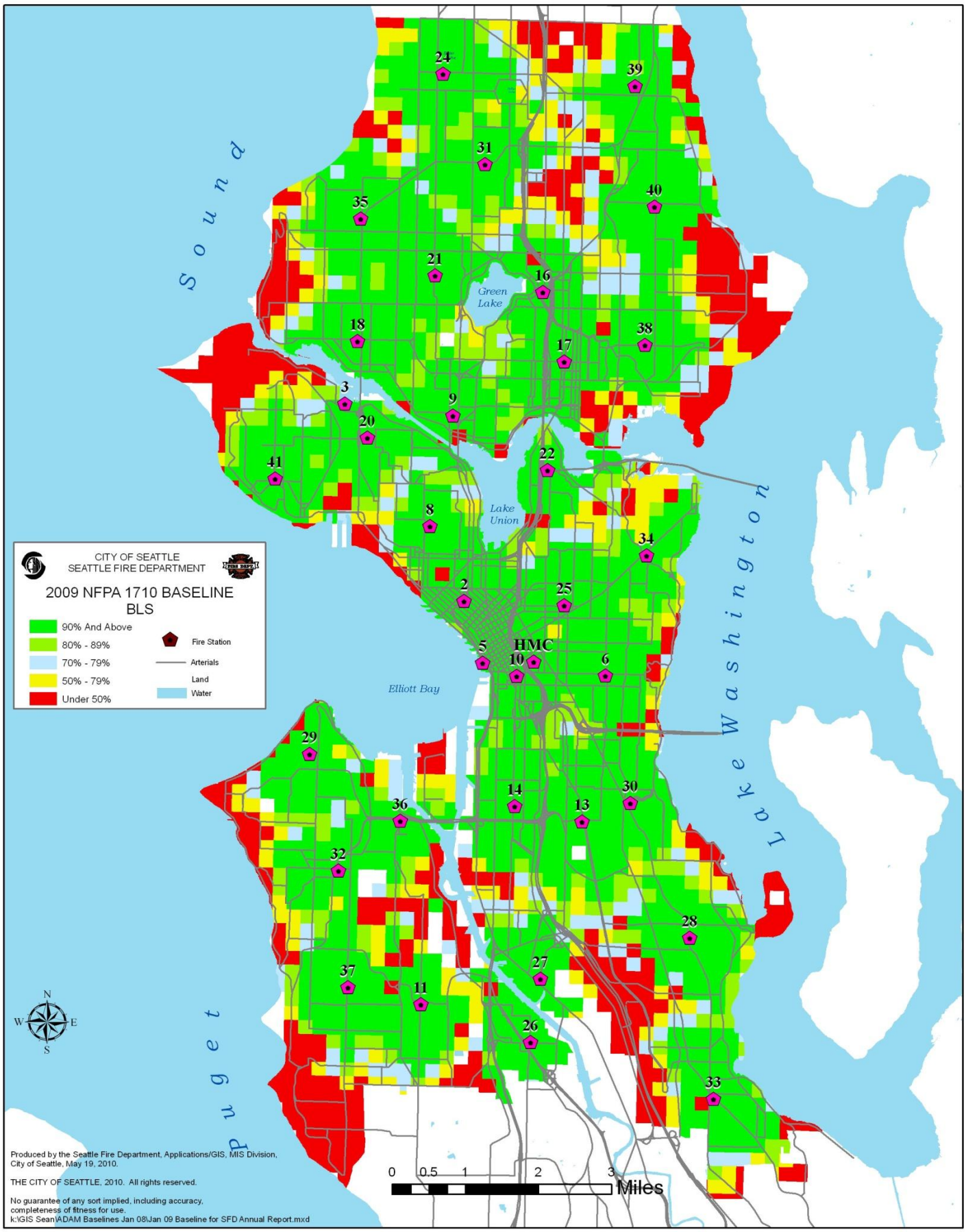
ANNEX D-I: FIRST ARRIVING ENGINE COMPANY



ANNEX D-II: FULL ALARM ASSIGNMENT COVERAGE



ANNEX D-III: BASIC LIFE SUPPORT COVERAGE



ANNEX D-IV: ADVANCED LIFE SUPPORT COVERAGE